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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,702	02/09/2004	Ikuya Yagisawa	16869N-104800US	9171

20350 7590 01/30/2006	EXAMINER
TOWNSEND AND TOWNSEND AND CREW, LLP	BRADLEY, MATTHEW A

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ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/775,702	YAGISAWA ET AL.
Office Action Summary	Examiner	Art Unit	
	Matthew Bradley	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>03 November 2005</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>22-32</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>22-32</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/6/05, 11/21/05</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action has been issued in response to amendment filed 3 November

2005. Claims 22-32 remain pending and are ready for examination. Applicant's

arguments have been carefully and fully considered in light of the instant amendment,

but they are not persuasive. Accordingly, this action has been made FINAL.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 6 October 2005 and

21 November 2005 was filed after the mailing date of the Office Action of 1 August 2005

for application 10/775,702. The submission is in compliance with the provisions of 37

CFR 1.97. Accordingly, the Examiner is considering the information disclosure

statement with a signed and initialed copy being attached hereto.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22-32 are rejected under 35 U.S.C. 102(b) as being anticipated by

Matoba (U.S. 5,611,069).

As per independent claim **22**, Matoba teaches,

- o a plurality of disks including first type disks configuring a RAID group and

at least one second type disk, wherein each of the first type disks store

one of data received from a computer coupled to the storage system or

parity data used for recovering the data received from the computer, and

wherein the at least one second type disk is used as a spare disk for

storing copy data of data stored in one of the first type disks; and (Column

4 lines 4-36) *The Examiner notes that Matoba teaches a mirror disk setup*

which is constructed to form an array of disks to store data. As shown in

Figures 1A and 1B, the system has a plurality of disks that are used for

this array construction. Further, parity is taught by Matoba in line 8 with

the recitation of "write data from an upper apparatus was striped" and with

the usage of RAID3 or RAID5 (Column 6 line 2) parity is inherent.

o   a control section configured to hold an error status of each of the first type

disks, start to mirror data between one of the first type disks and the at

least one second type disk when the error status of the one of the first

type disks matches a predetermined first criterion, (Column 6 lines 4-15).

The Examiner notes that Matoba teaches a "control section" that allows for

the "switching" when errors or faults are detected.

o   wherein, after starting to mirror data between the one of the first type disks

and the at least one second type disk, the control section is configured to

stop mirroring data between the one of the first type disks and the at least

one second type disk and start to mirror data between another one of the

first type disks and the at least one second type disk, according to the

error status of the one of the first type disks and the another one of the

first type disks. (Column 16 lines 18-67). *The Examiner notes that as taught in Column 16 lines 18-67 of Matoba, a fourth embodiment for the invention teaches the switching of present use disks based on an error status. Shown with Figure 18A and 18B, there are ports P0 through P4. These five ports are connected to ranks R0 through R3. Column 16 lines 38-40 of Matoba teach that, "the data reading and writing operations are executed in parallel for the ports P0 to P3 every rank of the disk array." As taught previously in Matoba and shown in Column 17 lines 36-55, the disks operate as mirror disk units. Since the data writing operations are executed in parallel, the Examiner is interpreting that parallel means the same data is written to at least two disks and is therefore mirroring the data.*

o *The Examiner is interpreting the disks P0 through P3 to each be first type disks or second type disks as instantly claimed since mirroring is taking place amongst all drives. The individual distinction between first type disks and second type disks comes, "when the number of errors of either one of the disk units reaches the threshold value and the occurrence of a fault is decided." The disk which triggers this event, or the disk which meets the error status, is labeled as a first type disk. The remaining disks in the rank R0 or any rank, are then interpreted to be at least second type disks. With respect to the switching of first type disks, as taught in Matoba, there is a disk, P4, which is used as a spare disk. As the disk*

exists on the rank in which the disk that the error occurred in, this disk, P4,

becomes the 'another one of the first type disks' as instantly claimed since

this disk is activated once the error criteria is met. Disk P4 is activated

and the operation continues without the first type disk that was in error.

o *Accordingly, Matoba does teach mirroring data between one of a first type*

disk and the at least one second type disk with disks P0 through P3.

Additionally, Matoba teaches that, the control section is configured to stop

mirroring data between the one of the first type disks and the at least one

second type disk (Column 16 lines 40-45) and to start to mirror data

between another one of the first type disks and the at least one second

type disk (disks P0 through P3 without the first type disk that was in error

and with P4 as 'another one of the first type disks'), according to the error

status of the one of the first type disks and the another one of the first type

disks (Column 16 lines 40-45).

As per dependent claim **23**, Matoba teaches, "the control section is configured to

compare the error status of each of the first type disks, and based on the result of error

status comparison between the one of the first type disks and the another one of the

first type disks, the control section is configured to stop mirroring data between the one

of the first type disks and the at least one second type disk and start to mirror data

between the another one of the first type disks and the at least one second type disk"

(Column 6 lines 4-45). *The Examiner notes that as discussed supra in the teachings of*

Matoba, the system of Matoba continuously checks for errors and when errors are

abound, the system switches to different disks for writing.

As per dependent claim **24**, Matoba teaches, "when the error status of one of the

first type disks matches a predetermined second criterion, the control section is further

configured to stop mirroring between the one of the first type disks and the at least one

second type disk and configure a RAID group including the at least one second type

disk instead of the one first type disks" (Column 6 lines 4-62). *The Examiner notes that*

as discussed supra, the system switches to a different set of disks for writing upon

meeting certain criteria . Additionally, Matoba teaches the 'second criterion' of the

instant claim with the recitation of "a timing corresponding to the half of the threshold

value (column 6 line 55)." This halving of the threshold value represents two values for

which the system of Matoba can act upon. Accordingly, the system of Matoba teaches

the limitation of "second criterion" by relying on a half of the threshold value instead of

the original threshold value.

As per dependent claim **25**, Matoba teaches, "wherein the error status of each of

the first type disks is error count of each of the first type disks, and both of the

predetermined first criterion and the predetermined second criterion are predetermined

values of error count" (Column 4 line 57 to column 5 line 12).

As per dependent claim **26**, Matoba teaches, "wherein the value of error count for

the predetermined first criterion is zero, whereby the control section is configured to

mirror data between the one of the first type disks and the at least one second disk

initially" (Column 3 lines 38-61). *The Examiner notes that the teachings of Matoba also*

allow for a system that continuously mirrors data. This variation of Matoba omits the

error checking subsystem, thus, this variation anticipates the instant claim.

As per dependent claim **27**, Matoba teaches, "wherein the error count for the first

criterion is updated according to the change of the error status of the first type disks

configuring a RAID group" (Column 12 lines 30-37). *The Examiner notes that the*

"abnormality counter" of Matoba is "increased by 1" for each error.

As per dependent claim **28**, Matoba teaches, "wherein the error status of each of

the first type disks is error count of each of the first type disks, and when the error count

of the another one of the first type disks becomes larger than the error count of the one

of the first type disks, the control section is configured to stop mirroring data between

the one of the first type disks and the at least one second type disk and start to mirror

data between the another one of the first type disks and the at least one second type

disk" (Column 16 lines 18-67).

As per dependent claim **29**, Matoba teaches, "wherein information indicating a

pair of disks configuring a mirroring pair is output from the storage system to a

management computer coupled to the storage system" (Column 11 lines 29-65).

As per dependent claim **30**, Matoba teaches, "wherein the predetermined first

criterion is updated based on the error status of the first type disks configuring a RAID

group" (Column 12 lines 12-52).

As per dependent claim **31**, Matoba teaches, "wherein the control section is

configured to start to mirror data between said another one of the first type disks and

the at least one second type disk before a plan of mirroring data between said one of

the first type disks and the at least one second type disk is completed" (Column 16 lines

40-45). *The Examiner notes that if the error threshold is never met, the disks would be*

mirrored without interrupting the plan. However, once the threshold is met, the plan is

interrupted and the mirroring takes place between another one of the first type disks and

the at least one second type disk as discussed supra.

As per dependent claim **32**, Matoba teaches, "wherein the control section is

configured to start to mirror data between said another one of the first type disks and

the at least one second type disk, if the error status of said another one of the first type

disks is greater than or equal to the error status of said one of the first type disks"

(Column 16 lines 18-67).

Response to Arguments

Applicant's arguments filed 3 November 2005 have been carefully and fully

considered but they are not persuasive.

With respect to applicant's argument located within the fourth full paragraph of

the first page of the remarks (numbered as page 5) which recites:

> *'Matoba does not teach or suggest that, after starting to mirror data between the
> one of the first type disks and the at least one second type disk, the control
> section is configured to stop mirroring data between the one of the first type disks
> and the at least one second type disk, according to the error status of the one of
> the first type disks and the another one of the first type disks.'*

The Examiner respectfully disagrees and refers applicants to the rejection *supra*

and the comments *infra*.

The Examiner notes that as taught in Column 16 lines 18-67 of Matoba, a fourth

embodiment for the invention teaches the switching of present use disks based on an

error status. Shown with Figure 18A and 18B, there are ports P0 through P4. These five ports are connected to ranks R0 through R3. Column 16 lines 38-40 of Matoba teach that, "the data reading and writing operations are executed in parallel for the ports P0 to P3 every rank of the disk array." As taught previously in Matoba and shown in Column 17 lines 36-55, the disks operate as mirror disk units. Since the data writing operations are executed in parallel, the Examiner is interpreting that parallel means the same data is written to at least two disks and is therefore mirroring the data.

The Examiner is interpreting the disks P0 through P3 to each be first type disks or second type disks as instantly claimed since mirroring is taking place amongst all drives. The individual distinction between first type disks and second type disks comes, "when the number of errors of either one of the disk units reaches the threshold value and the occurrence of a fault is decided." The disk which triggers this event, or the disk which meets the error status, is labeled as a first type disk. The remaining disks in the rank R0 or any rank, are then interpreted to be at least second type disks. With respect to the switching of first type disks, as taught in Matoba, there is a disk, P4, which is used as a spare disk. As the disk exists on the rank in which the disk that the error occurred in, this disk, P4, becomes the 'another one of the first type disks' as instantly claimed since this disk is activated once the error criteria is met. Disk P4 is activated and the operation continues without the first type disk that was in error.

Accordingly, Matoba does teach mirroring data between one of a first type disk and the at least one second type disk with disks P0 through P3. Additionally, Matoba teaches that, the control section is configured to stop mirroring data between the one of

the first type disks and the at least one second type disk (Column 16 lines 40-45) and to

start to mirror data between another one of the first type disks and the at least one

second type disk (disks P0 through P3 without the first type disk that was in error and

with P4 as 'another one of the first type disks'), according to the error status of the one

of the first type disks and the another one of the first type disks (Column 16 lines 40-45).

With respect to applicant's arguments located within the first paragraph of the

second page of the remarks (numbered as page 6) which recites:

> 'Therefore, Matoba discloses switching the present use disk and the spare disk,
> not switching two present use disks.'

The Examiner respectfully disagrees and refers applicants to the comments and

rejection *supra*.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time

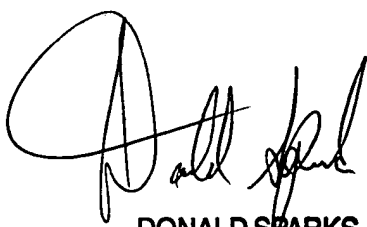policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DAS/mb

DONALD SPARKS
SUPERVISORY PATENT EXAMINER